



US Army Corps  
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Station

Soil Mechanics Information

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## Soils Research Program

A critically important civil works-funded research and development effort of the U. S. Army Corps of Engineers aims to improve safety and economy in design, construction, and operation of earth and rock-fill dams and other water control structures. This effort is defined by the Soils Research Program. The emphasis is on soil properties that significantly influence the performance of embankments, foundations, and appurtenant structures. Performance with respect to safety is the uppermost concern; improved efficiency, alternative methods and materials, better understanding of phenomena and processes, and more effective means of evaluating uncertainties are major factors. Work units are established to address specific technical deficiencies and provide cost-effective problem solutions to the user.

Work units address the testing of soils containing large particles, analysis of large deformations, and soil behavior under generalized stress paths. Others include the interpretation of in-situ tests, laboratory determination of soil properties, and methods of soil reinforcement. Future work units are planned to develop improvements in the application of analytical techniques and to make use of centrifuge modeling to address complex soil dynamics problems and eliminate the need for expensive, full-size prototypes. Future issues of the SMIAC Current Awareness Bulletin will highlight the status of some of these efforts.

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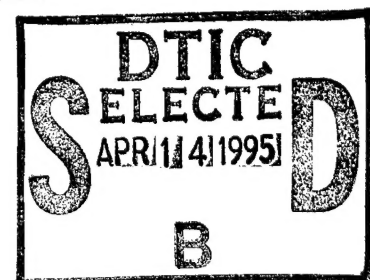
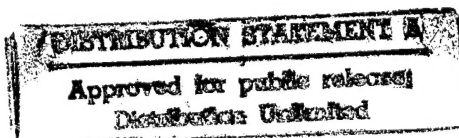
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# Testing Large-Particled Soils

Soils containing large particles are often found in nature and are used in the construction of embankment dams and other structures. Most soils laboratories are not capable of testing soils containing particles larger than 1 inch and use modeling procedures that have been shown to be inaccurate and inadequate when evaluated by the use of large-scale testing equipment. A Soils Research Program work unit entitled "Testing Large-Particled Soils" was developed to address these problems.

The objective is to eliminate deficiencies in current practices for both laboratory testing and fill compaction control.

Instruction Report GL-92-1 entitled "Compaction Control of Earth-Rock Mixtures: How to Develop and Use Density Interference Coefficients and Optimum Water Content Factors" was published as part of this research effort. It is listed and may be obtained as shown in the publication section of this bulletin.

The triaxial shear phase of this research is aimed at improving laboratory methods for determining the shear strengths of soils containing gravel-sized particles. It includes comparative testing among 15-, 6-, and 2.8-inch diameter specimens of full-scale gradations and their fractions. A final report will be published in FY96. Point of contact is Dr. Vic Torrey, 601-634-2619.



**Large particle soil testing**

## Upcoming Conferences

### **North American Society for Trenchless Technology**

April 30 - May 3

No Dig '95 conference and exhibition. Sheraton Center, Toronto, Canada. Contact: North American Society for Trenchless Technology, 435 North Michigan Ave., Suite 1717, Chicago, Ill. 60611-4067

(312) 644-0828.

### **Wessex Institute of Technology, U.K.**

May 1-3

Water Pollution '95

International conference on modeling, measuring, and prediction. Porto Carras, Greece. Contact: Susi King, Conference Secretariat, Wessex Institute of Technology, Ashurst Lodge, Ashurst, Southampton, SO40, 7AA, U.K. (44) (703) 293-223.

## Partial Listing of Recent Geotechnical Laboratory Publications

<i>Report No.</i>	<i>Date</i>	<i>Title</i>	<i>NTIS AD Number</i>
IR GL-92-1	04/92	Compaction Control of Earth-Rock Mixtures: How to Develop and Use Density Interference Coefficients and Optimum Water Content Factors	A251 070
TR ITL-94-7	09/94	Application of Computational and Visualization Methods to Groundwater Modeling	A286 422
TR DRP-94-5	09/94	Improved Site Characterization for Rock Dredging Using a Drilling Parameter Recorder and the Point Load Test	
TR GL-94-39	11/94	In Situ Shear Wave Measurements for Evaluating Dynamic Soil Properties at the Bannister Federal Complex, Kansas City, Missouri	
TR GL-94-40	12/94	Subsurface Site Characterization-Proceedings of Research Needs Workshop	
MP GL-94-49	09/94	Groundshock-Induced Hydrogeologic Response (Volume I and Volume II)	A285 642

The reports listed above having AD numbers can be obtained from: National Technical Information Service (NTIS), U.S. Department of Commerce, 5285 Port Royal Road, Springfield, VA 22161; telephone (703)487-4650. Please refer to the listed AD number. For those reports that do not have AD numbers, the report can be obtained from WES at (601)634-2571.

## Other Geotechnical Publications

Ballard, R. F. and R. G. McGee. (1994). "Acoustic Impedence for Assessing Subbottom Conditions". *Proceedings, DREDGING '94, ASCE Second International Conference on Dredging and Dredged Material Placement*. Vol.1, pp. 249-258.

Landin, M. C., J. Fowler, and H. H. Allen. (1994). "New Applications and Practices for Beneficial Uses of Dredged Material". *Proceedings, DREDGING '94, ASCE Second International Conference on Dredging and Dredged Material Placement*. Vol.1, pp. 526-536.

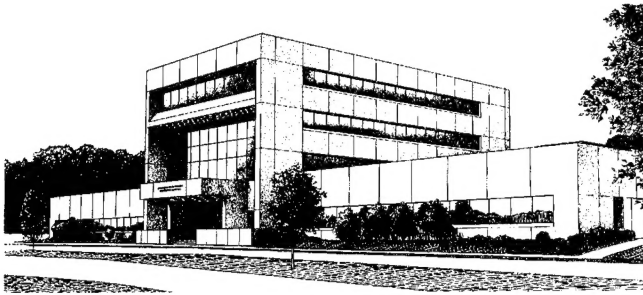
Llopis, J. L. and M. K. Sharp. (1995). "Geophysical Investigation for the Location of a Historic Heiau, Kawaihae, Hawaii". *Symposium on the Application of Geophysics to Engineering and Environmental Problems*. Environmental & Engineering Geophysics Society.

Rechtien, R. D., R. J. Greenfield, and R. F. Ballard. (1995). "Tunnel Signature Prediction for a Cross-Borehole Seismic Survey". *Geophysics, Society of Exploration Geophysicists*, Vol. 60, No.1, pp. 76-86.

Spigolon, S. J., R. M. Bakeer, and J. Fowler. (1994). "Knowledge-Based Expert Systems for Geotechnical Factors in Dredging". *Proceedings, DREDGING '94, ASCE Second International Conference on Dredging and Dredged Material Placement*. Vol.1, pp. 269-278.

Stark, T. D. and J. Fowler. (1994). "Strip Drains in Dredged Material Placement Areas". *Proceedings, DREDGING '94, ASCE Second International Conference on Dredging and Dredged Material Placement*. Vol.1, pp. 420-429.

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